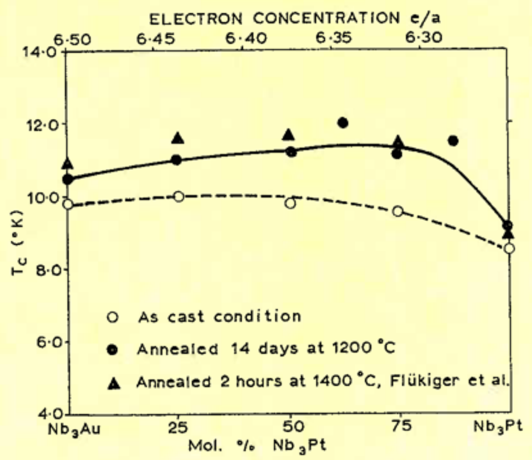

Fig. 5 Variation of superconducting transition temperature of $Nb_3Pt_{(1-x)}Au_x$ alloys in the as-cast and annealed conditions as a function of mol. % Nb_3Pt

The technological applications of superconductivity are emerging, but for materials research and solid state physics it has already become of increasing importance. Scientists involved have two things in mind, to synthesise a superconducting material having mechanical properties suitable to industrial needs and at the same time to understand the phenomenon in order to help in synthesising superconductors of high critical temperatures.

The investigation of gold compounds has helped modern solid state physicists to understand more about superconductivity. Whether a gold compound will ever show a T_c above 20 K one cannot predict. In no other field of science does the number of theoretical explanations of experimentally found effects surpass by so much the number of experimentally confirmed theoretical predictions as in the field of superconductivity.

References

1 B. T. Matthias, *Phys. Rev.*, 1955, **97**, 74
2 H. Fröhlich, *Phys. Rev.*, 1950, **79**, 845
3 J. Bardeen, L. N. Cooper and J. R. Schrieffer, *Phys. Rev.*, 1957, **108**, 1175
4 W. J. de Haas and J. Turriaanse, *Proc. Acad. Sci. Amsterdam*, 1932, **35**, 748
5 D. C. Hamilton, Ch. J. Raub, B. T. Matthias, E. Corenzwit and G. W. Hull, Jr., *J. Phys. Chem. Solids*, 1965, **26**, 665
6 E. E. Havinga, H. Damsma and P. Hokkeling, *J. Less-Common Metals*, 1972, **27**, 281
7 C. E. Olsen, B. T. Matthias and H. H. Hill, *Z. Phys.*, 1967, **200**, 7
8 Ch. J. Raub and D. C. Hamilton, *J. Less-Common Metals*, 1964, **6**, 486
9 B. W. Roberts, Progress in Cryogenics, Vol. 4, Heywood, London, 1964, p. 160
10 D. Farrell, J. G. Park and B. R. Coles., *Phys. Rev. Letters*, 1964, **13**, 328
11 G. Arrhenius, Ch. J. Raub, D. C. Hamilton and B. T. Matthias, *Phys. Rev. Letters*, 1963, **11**, 313
12 J. H. Wernick, A. Meuth, T. H. Geballe, G. Hull and J. P. Maita, *J. Phys. Chem. Solids*, 1969, **30**, 1949
13 B. W. Roberts, Progress in Cryogenics, Vol. 4, Heywood, London, 1964, p. 160
14 Ch. J. Raub., *Z. Phys.* 1964, **178**, 216
15 B. Stritsker, and H. Wuhl, *Z. Phys.*, 1971, **243**, 361; H. L. Luo, M. F. Merriam and D. C. Hamilton, *Science*, 1964, **145**, 581
16 E. Klokholm, and C. Chion, *Acta Met.*, 1966, **14**, 565; H. L. Luo, M. F. Merriam, and D. C. Hamilton, *Science* 1964, **145**, 581
17 Ref. 6 and V. Sadogopan, E. Pollard and H. C. Gatos, *Solid State Commun.*, 1965, **3**, 97; H. L. Caswell, *Phys. Letters*, 1964, **10**, 44
18 B. T. Matthias, T. H. Geballe, and V. B. Compton, *Rev. Mod. Phys.*, 1963, **35**, 1
19 P. Spitzli, R. Flükiger, F. Heininger and J. Muller, *Phys. Letters*, 1969, **30 A**, 170
20 H. L. Luo, E. Vielhaber and E. Corenzwit, *Z. Phys.*, 1970, **230**, 443
21 L. Creveling, H. L. Luo and G. S. Knapp, *Phys. Rev. Letters*, 1967, **18**, 851
22 S. T. Zegler, *Phys. Rev.*, 1965, **137 A**, 1438
23 G. Arrhenius, E. Corenzwit, R. Fitzgerald, G. W. Hull, Jr., H. L. Luo, B. T. Matthias and W. H. Zachariasen, *Proc. Natl. Acad. Sciences*, 1968, **61**, 621
24 G. W. Webb, L. J. Vieland, R. E. Miller and A. Wicklund, *Solid State Commun.*, 1971, **9**, 1769
25 E. Röschel, O. Loebich, Jr. and Ch. J. Raub, *Z. Metallkunde*, 1973, **64**, 359
26 H. R. Khan, E. Röschel and Ch. J. Raub, *Z. Phys.*, 1973, **262**, 279
27 E. C. van Reuth, R. M. Waterstrat, R. D. Blaugher, R. A. Hein and J. E. Cox, Proc. 10th Internat. Conference Low Temp. Physics Vol. IIB, p. 137; R. A. Hein, J. E. Cox, R. D. Blaugher, R. M. Waterstrat and E. C. van Reuth, Proc. Internat. Conference Science of Superconductivity, Stanford University, Stanford, California, 1969; E. C. van Reuth and R. M. Waterstrat, *Acta Cryst.*, 1968, **24**, 187; R. A. Hein, J. E. Cox, R. D. Blaugher, R. M. Waterstrat and E. C. van Reuth, *Physica*, 1971, **55**, 523
28 B. W. Roberts, Progress in Cryogenics, Vol. 4, Heywood, London, 1964, p. 160
29 T. F. Smith and H. L. Luo, *J. Phys. Chem. Solids* 1967, **28**, 569
30 M. C. Krupka, A. L. Giorgi, N. H. Krikorian and E. G. Szklarz, *J. Less-Common Metals*, 1969, **19**, 113

Gold-Chromium Films for Solar Energy Conversion

The optical properties of thin films of gold and of certain of its alloys make them particularly suitable for use in solar energy collectors and concentrators. In particular, films of gold-chromium alloys offer not only high resistance to corrosion in this field but improved mechanical properties and excellent adhesion to glass.

More detailed data on the properties of gold and a series of gold-chromium alloys have now been reported by a team of investigators at Rutgers University, B. Lalevic, W. Slusark, A. Delahoy and the late N. Fuschillo (*J. Vac. Sci. Technol.*, 1975, **12**, (1), 84–87). The work, supported by P.P.G. Industries, involved transmission and reflectance measurements on sputtered gold-chromium films of two types—opaque films 1500Å in thickness and thin films ranging from 100 to 400Å. The results are used to calculate figures of merit for the heat mirror type of solar energy collector.